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A Non-Tariff Protectionist Bias in Majoritarian Politics: Government Subsidies and Electoral Institutions[1]

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Governments elected by majoritarian rules are, according to conventional wisdom, more protectionist than governments elected by proportional rules. However, existing tests of this claim examine only one possible form of trade protection: tariffs. This leaves open the possibility that governments in majoritarian systems provide no more protection than governments in proportional systems but simply use tariffs more often than other forms of trade protection. Does the protectionist bias in majoritarian politics extend beyond tariffs? The current study addresses this question by examining an increasingly important form of trade protection: subsidies. In a sample of 68 countries from 1990 to 2006, spending on subsidies is found to be higher in majoritarian systems than in proportional systems, holding all else equal. The implication is that the protectionist bias in majoritarian systems does in fact extend beyond tariffs.

The economic crisis that began in 2008 prompted fears that governments would turn to trade protection.[2] While these fears appear to have been largely unwarranted, modest moves toward protection did occur. Governments generally did not, however, raise tariffs. Instead, they tended to use non-tariff barriers (NTBs) to shelter their domestic markets. Subsidies, for example, increased in many countries from mid-2008 (OECD 2010). Governments' use of subsidies in response to the ''great recession'' serves as a reminder that tariffs are just one means by which governments can protect domestic markets. Trade protection is possible through a wide variety of policies, including subsidies, countervailing duties, and voluntary export restraints.

The fact that tariffs are just one of many possible forms of trade protection raises an important question about the apparent ''protectionist bias'' in majoritarian politics (Grossman and Helpman 2005). Governments elected by majoritarian rules are, according to conventional wisdom, more protectionist than governments elected by proportional rules. Yet, existing tests of this claim focus exclusively on tariffs (for example, Evans 2009). By considering only tariffs, existing studies leave open the possibility that electoral rules have an ambiguous effect on trade protection. Governments in majoritarian systems may provide no more (or less) protection than governments in proportional systems; instead, majoritarian governments may simply use tariffs more often than other forms of trade protection.[3] Consequently, the important but unanswered issue is whether or not the protectionist bias in majoritarian politics extends beyond tariffs.

The current study addresses this issue by examining an increasingly important non-tariff barrier: subsidies. As international agreements restrict the use of tariffs, governments employ subsidies to protect their markets from international trade (Ford and Suyker 1990; OECD 1998). On average, governments in developed countries allocate nearly ten percent of total government expenditures to subsidies, grants, and subsidized loans (IMF 2001a), and subsidies likely account for an even greater share of governmental expenditures in developing countries (Fan and Rao 2003).

Despite the growing importance of subsidies, only a few studies explicitly examine government spending on subsidies and all of these studies focus exclusively on developed countries (for example, Blais 1986; Verdier 1995; Alt, Carlsen, Heum, and Johansen 1999; Zahariadis 2001; Aydin 2007). The current study aims to redress this limitation by investigating the effects of electoral rules on subsidies in developing and developed countries. The reported findings show that governments elected by majoritarian electoral rules spend a larger share of their total budgets on subsidies than governments elected via proportional rules, holding all else equal. This suggests that the protectionist bias in majoritarian politics does, in fact, extend beyond tariffs.

The following sections briefly review the relevant literature, and examine in detail the data, the empirical model, and estimated results. The concluding section discusses the implications of this study for the politics of subsides and trade protection.

Existing Studies

A rich theoretical literature explores the relationship between electoral systems and economic outcomes (for example, Lizzeri and Persico 2001; Milesi-Ferretti, Perotti, and Rostagno 2002; Persson and Tabellini 2003), and parallel to these studies is a relatively small but growing theoretical literature on the effects of

[1] *Author's note:* Thank you to Chad Rector and David Singer for their invaluable comments on an early version of this paper.

[2] ''Statement from G-20 Summit,'' *New York Times*, November 15, 2008.

[3] Kono (2006) argued that governments have electoral incentives to consider carefully not just the total level of trade protection but also the policy tools used to provide protection.

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electoral systems on trade policies. The seminal work in this emerging area of interest is the Grossman and Helpman (2005) model in which a national legislature sets trade policy. In the simplest version of their model, legislators represent districts with interests tied to district-specific industries. The model involves a two-party political system in which each party has equal chances of winning a given seat in a given district. The Grossman and Helpman model posits three electoral districts; each district contains one-third of the population and elects one legislator. Upon forming the government, the delegation from the majority party seeks to maximize the welfare of its constituents. If the party in power represents all three districts, then the legislature, in effect, works to maximize the welfare of the entire country and consequently sets tariffs at zero. In contrast, if the governing party holds a majority by winning seats from two of the three districts, it seeks to maximize the joint welfare of only those two districts by setting tariff rates above zero.

It is more likely that the government will represent all three districts in proportional systems. In contrast, the governing party is more likely to represent only two of the three electoral districts in majoritarian systems. This implies that, on average, tariff rates will tend to be higher in majoritarian systems than in proportional rule (PR) systems.[4] Hence, the Grossman and Helpman model predicts a ''protectionist bias'' in majoritarian systems.

However, related theoretical models produce opposite predictions. For example, a model developed by Rogowski and Kayser (2002), although not exclusively a model of trade protection, seems to imply that protection will be greater in PR systems than in majoritarian systems. In the Rogowski and Kayser model, the key distinction between electoral systems is the seat-vote elasticity. Majoritarian systems have greater seat-vote elasticities than PR systems, and as a result, a loss of votes translates into a greater loss of seats for parties competing in majoritarian systems. Since alienating voters accompanies higher political risk, Rogowski and Kayser predict that consumers will be relatively more powerful in majoritarian systems than in PR systems. Consumers' interests are therefore more likely to outweigh producers' demands for protection in majoritarian systems, implying that the level of trade protection will be greater in PR systems than majoritarian systems.[5]

The theoretical model developed by Bueno de Mesquita, Smith, Silverson, and Morrow (2003) also suggests that trade protection may be greater in PR systems than majoritarian systems. The Bueno de Mesquita et al. model examines the consequences of the winning coalition's size. A winning coalition is a subset of the selectorate with sufficient size to allow the subset to endow leadership with political power to negate the influence of the remainder of the selectorate and the disenfranchised members of the society (Bueno de Mesquita et al. 2003:51). As the size of the winning coalition grows, the cost of private goods, such as subsidies, increases. Governments interested in retaining power therefore switch to public goods, which are indivisible and non-excludable and consequently benefit everyone in society. Governments with larger winning coalitions will have a greater share of public goods in their policy provisions. Bueno de Mesquita et al. (2003) assert that the winning coalition is larger in majoritarian systems than in PR systems,[6] and accordingly, their logic dictates that spending on subsidies should be relatively lower in majoritarian systems.

In sum, competing predictions emerge from the theoretical literature. Some models imply subsidies will be higher in PR systems; others predict more generous subsidies in majoritarian systems. Ultimately then, it is an empirical question as to which electoral system produces higher levels of government spending on subsidies. However, no empirical study has, to date, explicitly examined the relationship between electoral rules and subsidies. Instead, previous studies of electoral systems and trade protection have tended to focus only on tariffs. For example, Ehrlich (2007) finds that proportional electoral rules have a robust negative effect on tariffs.[7] PR is significantly associated with 7.3 percent lower tariffs in the long run in a sample of 21 OECD countries, during 1948 to 1994 (Ehrlich 2007:595). However, Ehrlich, like Rogowski (1987), argued that the effect of PR on tariffs is indirect: PR leads to lower tariffs to the extent that PR engenders party discipline and a small number of electoral districts. Controlling for the number of parties in a government, the number of electoral districts, and a measure of party strength, proportional electoral rules do not appear to have a robust long-run effect on tariffs in Ehrlich's sample.

In contrast, Evans (2009) found a robust relationship between electoral rules and tariffs in a sample of 147 countries during the period 1981 to 2004. The Evans study compared average tariffs in countries with majoritarian systems with average tariffs in proportional systems and found that countries with majoritarian systems do indeed have higher average tariffs than countries with proportional systems. These results suggest a protectionist bias exists in majoritarian systems with regard to tariffs, but leaves unanswered the issue of whether or not this bias extends to other forms of trade protection, such as subsides.

Although Mukherjee (2003) does not test the effect of electoral rules on subsidies, he reports evidence that suggests subsidies may, in fact, be more generous in PR systems than in majoritarian systems. Specifically, Mukherjee found that having more political parties in a multiparty legislature increases spending on ''targetable'' programs, measured by the sum of subsidies, social security, social assistance benefits, and

[4] This expectation is consistent with a number of other models of the relationship between electoral systems and economic outcomes that conclude politicians under proportional systems are more likely to favor programs with benefits for large segments of a country's population. See, for example, Persson and Tabellini (2003).

[5] In contrast, Rogowski (1987) argues that PR systems are more likely to foster and sustain trade openness.

[6] However, Persson and Tabellini (2003) make the opposite claim.

[7] See also Nielson (2003) and Hankla (2006). Nielson found that countries with electoral system that create incentives to cultivate a personal vote tend to have relatively higher tariffs, all else equal. Hankla argues that tariffs tend to be higher in countries in which candidates have free access to the ballot.

employers' social benefits. Given that PR systems tend to have more parties than majoritarian systems, Mukherjee's results imply that spending on subsidies may be greater in PR systems than in majoritarian systems. This result hints that the protectionist bias in majoritarian systems may not extend to subsidies.

Tariffs Versus Subsidies

The cross-national pattern of subsidies may differ from tariffs. Subsidies may, for example, be substitutes for tariffs. Groups already well protected by tariffs may bring less pressure for subsidies and face more governmental resistance to their demands than less well-protected groups. Bhagwati (1988) referred to this dynamic as the law of constant protection. Some empirical support exists for the law of constant protection; Kono (2006), for example, found evidence that tariffs and quality NTB, such as product standards, labelling, and certification requirements, are substitutes.

If tariffs and NTBs are substitutes, then studies that focus exclusively on tariffs will find relationships that are reversed for NTBs. If, for example, tariffs are higher in majoritarian countries, but tariffs and NTBs are substitutes, then NTBs will be higher in PR countries. This may explain why, for example, Evans (2009) found that tariffs are higher in majoritarian countries while Mansfield and Busch (1995) found that NTBs are higher in PR countries. The NTBs examined by Mansfield and Busch (1995) do not, however, include subsidies; therefore, the relationship between electoral systems and subsidies remains unknown.

Investigating the effects of electoral rules on subsidies is an important endeavour because the incentives to provide subsidies may be fundamentally different from the incentives to provide tariffs and the salience of these incentives may vary systematically with electoral systems. For example, subsidies may be more ''targetable'' than tariffs (McGillivray 2004). In general, tariffs benefit all producers of a particular good or service. In this sense, tariffs protect entire industries; conversely, subsidies can be targeted to select firms within an industry. For example, subsidies can be tied to debt levels, which would favor firms that have made substantial capital investments (McGillivray 2004). Subsidies may, therefore, be the preferred policy tool for politicians interested in targeting narrowly the benefits of protection. Numerous studies argued that politicians competing in majoritarian systems have a greater interest in narrowly targeting benefits than politicians competing in PR systems (for example, Persson and Tabellini 1999; Lizzeri and Persico 2001; Milesi-Ferretti et al. 2002). Politicians in majoritarian systems may therefore have even greater incentives to use subsidies. In other words, the protectionist policies in majoritarian systems may have a more pronounced bias toward subsidies compared with tariffs.

The incentives to provide subsidies may also differ from the incentives to provide tariffs for the simple reason that subsidies require expenditures while tariffs do not. Tariffs impose taxes on imports and consequently generate revenue for governments. In contrast, subsidies require fiscal outlays by the government. In this sense, tariffs and subsidies are fundamentally different—one is revenue-generating while the other is an expense. For this reason, subsidies may be more common in PR systems because governments in proportional rule systems tend to spend more than governments in majoritarian systems, as demonstrated in previous studies (for example, Mukherjee 2003; Bawn and Rosenbluth 2006; Persson, Rolland, and Tabellini 2007). Governments in PR systems may spend more on subsidies—not because they are more protectionist than governments in majoritarian systems—but simply because they have higher spending levels. This provides a compelling reason to examine subsidies as a percentage of total government expenditures, as discussed in the following section.

Measuring Subsidies

Spending on subsidies is calculated using the International Monetary Fund's Government Finance Statistics (GFS), which permit comparisons across countries and over time. Conventional government accounts are generally not suitable for these purposes because they reflect the organizational structures of government (IMF 2001b). The IMF GFS data avoid the problems of organizational differences between countries, thereby allowing for meaningful cross-national comparisons.

The variable *Subsidy* is based on consolidated central government outlays categorized by the Classification of the Functions of Government (COFOG).[8] Available COFOG data have two levels of detail: Divisions and Groups. The Divisions represent the broad objectives of government, while Groups detail the means for achieving these broad objectives.[9] To construct the variable *Subsidy*, spending data are taken from the Economic Affairs Division and include only those spending programs attributed to domestic economic sectors, such as manufacturing or agriculture, by Group classification. These spending data include, for example, central government expenditures on grants, loans, and subsidies to support manufacturing enterprises (IMF 2001b).[10] Spending across economic sectors is summed together to bypass the problem of context-specific party–sector relationships and estimate the total amount of government-funded subsidies.

This measure of subsidies represents a significant improvement over measures used in previous studies. Existing studies mainly use the World Bank's subsidy variable, which includes:

[8] To ensure comparability, only data based on cash accounting methods are used. The cash accounting method records revenues and expenditures when cash is received and paid, respectively. Consolidated central government spending is the exclusive focus of the current study because data on general governmental spending are often missing and when available tends to be less reliable than central governments' spending data (Persson and Tabellini 2003). Furthermore, the precise definition of local and regional governments' outlays are often incomparable among countries and time periods (Persson and Tabellini 2003).

[9] For further information on COFOG, see Classifications of Expenditure According to Purpose (United Nations 2000).

[10] The Government Finance Statistics Manual (IMF 2001b: Annex to Chapter 6) contains further information on the precise spending programs included in the *Subsidy* variable.

> [S]ubsidies, grants, and other social benefits including all unrequited, nonrepayable transfers on current account to private and public enterprises; grants to foreign governments, international organizations, and other government units; and social security, social assistance benefits, and employer social benefits in cash and in kind. (World Bank 2010)

In contrast, the measure of subsidies used in the current study specifically excludes international spending and spending on social security, social assistance benefits, and employer social benefits in order to isolate government spending on subsidies for domestic economic sectors.[11]

Subsidies are reported as a percentage of total governmental outlays. Measuring subsides as a share of total outlays eliminates the issue of governments' overall propensity to spend and estimates instead the government's propensity to use subsidy protection, given some prior (exogenous) decision about the size of government. This measurement strategy is particularly important if PR systems spend more than majoritarian systems. In this case, PR systems may spend more on subsidies—not because they are any more protectionist than majoritarian systems, but because they have electoral incentives to sustain higher levels of government spending. Reporting subsidies as a percentage of total outlays captures the relative importance of subsidies among a government's spending priorities. Governments that spend a larger share of their total budget on subsidies exhibit a ''protectionist bias'' in their funding allocations.

The proposed measurement strategy has additional benefits: First, it eliminates concerns about the many factors that affect the size of government but have nothing to do with trade protection. Using this measure consequently obviates the need for many controls and reduces concerns about omitted-variable bias. Second, the composition of government expenditure is itself an important aspect of government policy—candidates and parties often differentiate themselves by how they would prioritize expenditures if elected (Brender and Drazen 2009). Furthermore, the composition of government spending may represent governments' policy positions (Brender and Drazen 2009). Allocating a greater share of total expenditures to subsidies may signal a more general protectionist position.

Measuring Electoral Rules

The current study uses three different variables to measure countries' electoral rules: The first, broad definition classifies countries as majoritarian if plurality rules control election to any of the legislative bodies in the country. More precisely, the variable *Plurality* is coded 1 if winner-take-all/first-past-the-post electoral rules govern the selection of members to a legislative body in the country, and 0 otherwise. This variable comes from the World Bank's Database of Political Institutions (Beck, Clarke, Groff, Keefer, and Walsh 2001).

The second definition classifies countries as majoritarian if plurality electoral rules control most of the seats in the lower house. Specifically, the variable *Housesys* equals 1 if plurality electoral rules select most of the seats in the lower house, and 0 if most of the seats are filled via proportional rule. This variable comes from the World Bank's Database of Political Institutions (Beck et al. 2001).

The third definition attempts to measure the electoral incentives that exist in mixed-member systems. Mixed-member electoral systems typically combine nominal-tier elections with list-tier elections. In the former, citizens vote for individual candidates who accrue votes independently of party affiliation (Shugart and Wattenberg 2001; Thames and Edwards 2006). In the latter, the distribution of legislative seats is according to votes for multiple candidates nominated on party lists (Shugart and Wattenberg 2001; Thames and Edwards 2006).

Shugart and Wattenberg (2001) and Thames and Edwards (2006) classified mixed-member electoral systems as being either mixed-member majoritarian (MMM) or mixed-member proportional (MMP). In MMM systems, the list and nominal tiers allocate seats independently, with no attempt to maintain proportionality between seats and votes. In MMP systems, the total number of legislative seats received by a party is proportional to its list-tier results. Since linking the tiers obtains outcomes that are proportional, MMP systems often resemble pure PR systems. In contrast, MMM systems more closely resemble pure majoritarian systems (Bawn and Thies 2003). Several previous studies of the effects of mixed-member systems have demonstrated the similarity between MMM and majoritarian systems and MMP and PR systems (Moser 2001; Cox and Schoppa 2002; Ferrara and Herron 2005; Thames and Edwards 2006).

Given this, MMM systems are grouped together with majoritarian systems in the third measure of electoral systems, and MMP systems are grouped with PR systems. Specifically, the variable *Mixed* equals 1 if the country is classified as MMM by Shugart and Wattenberg (2001)/Thames and Edwards (2006), or plurality electoral rules are used to fill most seats in the lower house. *Mixed* equals 0 if the country is has a MMP classification, according to Shugart and Wattenberg (2001)/Thames and Edwards (2006), or proportional electoral rules fill most of the lower house's seats.

Electoral rules are most likely to matter in high-functioning democracies. For this reason, the sample includes only countries with a PolityIV score of six or greater.[12] Given this selection criteria, the sample consists of an unbalanced panel of 68 countries from 1990 to 2006.[13] The sample includes both developed and developing countries from virtually every region of the world, and consequently, the current study dif-

[11] As Bueno de Mesquita et al. (2003:31) suggested, distinguishing empirically between public and private goods is difficult since these can be and usually are mixed. Given this reality, it is possible that the subsidy measure includes spending on some public goods, despite the attempts to exclude public good-type programs. However, this would likely bias against finding an electoral system effect because electoral rules are theorized by Bueno de Mesquita et al. (2003) and others to have opposite effects on public and private goods.

[12] This is common practice in studies of electoral institutions; the same selection criteria are employed by Hankla (2006), Evans (2009), and others.

[13] Missing data for some country-years means that the sample used to estimate some of the models are smaller.

fers from previous studies of subsidies, which focused exclusively on developed countries.

Several additional variables are included as controls. Since the *Subsidy* variable refers only to central government expenditures, *Federal*, a dichotomous variable coded 1 for federal systems and 0 otherwise, is included. Central government spending on subsidies may be lower in federal systems than non-federal systems because some of the burden of subsidizing industries may fall to regional and local governments. This differentiation would be particularly problematic if federal systems covary with electoral systems. In other words, if plurality electoral systems are more frequent in federal systems, a spurious negative correlation between plurality electoral rules and subsidy spending may emerge. Including *Federal* as a control variable minimizes this possibility.

Left Government is a dichotomous variable coded 1 if the largest governmental party is left of centre and 0 otherwise. In general, governments' industrial policies tend to have only a minimal ideological component (McGillivray 2004). Indeed, Verdier (1995) found that left-leaning governments spend more on subsidies favouring labour, while right-leaning governments spend more on subsidies that favour capital. Consequently, the effect of a government's ideology on total subsidies may be ambiguous. However, controlling for ideology is important because leftist governments tend to be associated with proportional electoral systems (Iversen and Soskice 2006). Failure to control for the ideological tendency of a government could, therefore, result in mistakenly assigning explanatory power to electoral rules rather than ideology.

Trade openness, measured as the sum of imports and exports as a percentage of GDP, is also included as a control variable. Subsidies help domestic producers compete with lower cost foreign goods (for example, Corden 1957; McGillivray 2004). Producers facing higher levels of international trade may therefore make greater demands for subsidies (Rickard, in press). If trade openness is also systematically related to electoral rules, as suggested by Rogowski (1987), a spurious correlation may emerge between electoral rules and subsidy spending. To minimize this possibility, trade is included as a control. Lagging *Trade* by 1 year helps to minimize concerns about endogeneity.[14]

The proposed model also includes several economic variables: GDP per capita, current account balance, and economic growth.[15] Although these variables are unlikely to vary systematically with both electoral rules and subsidies, their inclusion addresses the potential effects of budget constraints on subsidies. A country experiencing a strengthening of their current account balance, for example, may reduce total government expenditures (Clements, Rodriguez, and Schwartz 1998). Although governments may devote the same share of spending to subsidies following a decrease in total expenditures, they may choose instead to cut subsidies more (or less) than other fiscal programs during hard times (Rickard, in press). This possibility necessitates the inclusion of these economic variables.[16]

International agreements restrict some governments' ability to provide subsidies. For example, Articles 87 and 89 of the Treaty of the European Union prohibit many types of subsides, and cost-imposing sanctions enforce these restrictions. For example, the EU Commission can order recipients of illegal subsidies to refund the value of the subsidy with interest. Governments found guilty of providing illegal subsidies face the reputation costs of violating EU rules and the potential costs for damages awarded by domestic courts. EU member countries may therefore exhibit lower average levels of subsidy spending than non-member countries. To account for this, a dummy variable, coded 1 for EU member country-years, and zero otherwise, is included in all estimated models.

Similarly, all estimated models include a dummy variable indicating the country-years in which national governments are bound by the World Trade Organization's (WTO) Agreement on Subsidies and Countervailing Measures. The Agreement on Subsidies and Countervailing Measures restricts the use of certain types of subsidies by WTO members. Similar to the EU restrictions on subsidies, the WTO rules are enforced through cost-imposing sanctions. As a result, WTO member countries may exhibit lower average levels of spending on subsidies than non-WTO members.

Results

Table 1 reports the results from a simple partial-adjustment ordinary least squares (OLS) model with year-fixed effects and robust standard errors.[17] Year-fixed effects are useful because the question motivating this study ultimately seeks to explain the cross-national variation in subsidies. Including year-fixed effects allows for identification of variation across countries, while holding time-variant effects constant. Year-fixed effects capture, for example, important differences in regional and international conditions during the course of the sample period. If governments increase spending on subsidies in response to negative economic shocks, and negative shocks are more acute for some groups of countries than for others, then the relationship

[14] Trade openness is the best possible specification for protectionist demands, considering the aggregate level of subsidy data. The potential alternative, import penetration, is generally calculated for individual sectors or industries. However, subsidies are aggregated across economic sectors in the current study to bypass the problem of context-specific party–sector relationships. The method for constructing a measure of import penetration that would match the level of aggregation of the subsidy data is unclear. Consequently, total trade is the best estimate of protectionist demands. Imports as a percentage of GDP are substituted for total trade as a robustness check. Substituting *IMPORTS* for *TRADE* does not change the key results; the coefficients for all electoral system variables remain positive and statistically significant. Although the coefficients for the electoral systems variables increase in magnitude when *IMPORTS* and *TRADE* are introduced to the model, the electoral system coefficients remain statistically significant and correctly signed when both trade variables are excluded.

[15] Data come from the World Bank's World Development Indicators (2010).

[16] These are standard control variables in models of government spending (for example, Clements et al. 1998; Mukherjee 2003; Brender and Drazen 2009). GDP per capita, current account balance, and economic growth are all lagged by 1 year to account for the fact that government budgets are generally decided upon prior to the year in which spending occurs.

[17] The very small number of electoral system reforms in the sample makes it highly inefficient to include country-fixed effects in the model.

TABLE 1. Estimated Effect of *Plurality* on Subsidies

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS
Plurality	1.701 (0.497)***	2.562 (0.628)***	2.875 (0.652)***	2.883 (0.656)***	2.836 (0.649)***	2.380 (0.627)***
Left Government		−2.266 (0.518)***	−2.308 (0.526)***	−2.182 (0.536)***	−2.197 (0.533)***	−2.076 (0.523)***
Federal		−5.798 (0.590)***	−5.323 (0.742)***	−5.625 (0.778)***	−5.545 (0.771)***	−4.773 (0.738)***
L. Trade			0.010 (0.010)	0.002 (0.010)	0.004 (0.011)	0.000 (0.011)
L. Current account				−0.152 (0.099)	−0.143 (0.100)	−0.065 (0.104)
L. Growth					0.171 (0.092)*	0.195 (0.099)**
L. GDP per capita (log)						−1.058 (0.304)***
EU	−3.944 (0.626)***	−3.562 (0.624)***	−3.382 (0.642)***	−3.433 (0.667)***	−3.438 (0.653)***	−2.542 (0.633)***
WTO	−0.778 (1.121)	−1.120 (1.421)	−0.906 (1.503)	−0.720 (1.550)	−1.452 (1.696)	0.186 (1.702)
Constant	11.61 (1.341)***	12.95 (1.302)***	12.03 (2.589)***	12.81 (2.574)***	12.48 (2.615)***	20.07 (3.580)***
Observations	526	417	380	368	362	359
R^2	0.092	0.264	0.277	0.294	0.306	0.330
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

(*Notes.* OLS, ordinary least squares; WTO, World Trade Organization. Robust standard errors are given in parentheses. ***$p < .01$, **$p < .05$, *$p < .1$.)

between subsidies and at least some of the independent variables may change over time. Including year-fixed effects controls for this possibility.[18]

In Table 1, countries' electoral rules are measured using the variable *Plurality*. All estimated coefficients for *Plurality* are positive and statistically significant. Column 1 reports the most parsimonious model; it includes only *Plurality*, *European Union*, and *WTO*. Column 2 introduces two additional domestic political variables: *Federal* and *Left Government*. Each subsequent model introduces one economic variable at a time. In the each of these models, *Plurality* has a robust, positive effect on subsidies. Governments, in countries that have a legislative body filled by winner-take-all/first-past-the-post, spend relatively more of their budgets on subsidies, holding all else equal. The magnitude of the electoral rule effect is large: On average, governments in majoritarian systems spend 2.5 percentage points more on subsidies than governments in PR systems.[19]

Table 2 reports the results from models estimated using the variable *Housesys* to measure countries' electoral rules. The estimated coefficients for *Housesys* are positive and statistically significant in all models. Taken together, the estimated coefficients for *Housesys* show that governments in democratic countries where most of the seats in the lower house are filled via plurality electoral rules spend relatively more of their budgets on subsidies, holding all else equal. On average, governments in countries that elect legislators via plurality electoral rule to most of the seats in the lower house spend 1.7 percentage points more on subsidies than countries in which proportional electoral rules govern most of the lower house elections.

Table 3 reports the results from models that use the variable *Mixed* to measure countries' electoral rules. Across all estimated models, the coefficients on *Mixed* are positive and statistically significant. Governments in democratic countries that have MMM systems and/or plurality electoral rules for most of the seats in the lower house spend relatively more of their budgets on subsidies, holding all else equal. This result confirms previous findings that MMM systems closely resemble pure majoritarian systems, while MMP systems are more similar to pure PR systems (Moser 2001; Cox and Schoppa 2002; Bawn and Thies 2003; Ferrara and Herron 2005; Thames and Edwards 2006). The magnitude of the estimated coefficients for *Mixed* is slightly smaller than those for *Housesys* or *Plurality*. On average, countries, for whom *Mixed* is coded 1, spend 1.5 percentage points more on subsidies than countries for whom *Mixed* is coded 0. Perhaps this is evidence of the competing incentives that exist in mixed-member electoral systems.

In sum, electoral rules are a robust predictor of government spending on subsidies. The share of total expenditures allocated to subsidies is higher in countries with majoritarian electoral rules than in countries with proportional electoral rules, holding all else equal. The noted difference demonstrates that the protectionist bias in majoritarian politics does, in fact, extend beyond tariffs to government spending.

A few words about the estimated effects of some of the control variables are in order. Central governments' spending on subsidies is lower in federal systems than in non-federal systems. In all of the estimated models, the coefficients on *Federal* are negative and statistically significant. This suggests that in federal systems, state, local, and/or regional governments fund some subsidies.

Countries with greater exposure to foreign trade spend relatively more on subsidies, all else equal. The estimated coefficients for *Trade* are always positive and reach conventional levels of statistical significant in some models. Governments may fund subsidies to shield domestic producers from the effects of international trade (Rickard, in press). Typically, the assumption in much of the literature on trade and spending is that governments respond to trade by increasing spending on social welfare programs (for example, Garrett 2001; Rudra 2002). The results reported here show that governments may also use subsidies to offset the costs of trade. Understanding when and under what circumstances governments use a particular fiscal policy in

[18] Evans (2009), whose study most closely approximates the current study—albeit with tariffs rather than subsidies—also includes year-fixed effects. Including year-fixed effects in the current study makes direct comparisons with Evans' tariff results more appropriate. Estimating the models without year-fixed effects produces very similar results.

[19] The coefficients on *Plurality* for all six models are averaged.

TABLE 2. Estimated Effect of *Housesys* on Subsidies

	(1) *OLS*	*(2)* *OLS*	*(3)* *OLS*	*(4)* *OLS*	*(5)* *OLS*	*(6)* *OLS*
Housesys	1.176 (0.616)*	1.411 (0.667)**	1.920 (0.700)***	2.029 (0.729)***	1.901 (0.717)***	1.950 (0.688)***
Left Government		−2.463 (0.508)***	−2.624 (0.516)***	−2.532 (0.533)***	−2.666 (0.530)***	−2.602 (0.508)***
Federal		−5.420 (0.525)***	−4.616 (0.706)***	−4.872 (0.744)***	−4.616 (0.727)***	−3.715 (0.669)***
L. Trade			0.017 (0.009)**	0.012 (0.009)	0.017 (0.010)*	0.015 (0.009)
L. Current account				−0.168 (0.103)	−0.155 (0.104)	−0.041 (0.106)
L. Growth					0.207 (0.093)**	0.230 (0.097)**
L. GDP per capita (log)						−1.425 (0.327)***
EU	−4.169 (0.634)***	−3.790 (0.673)***	−3.589 (0.693)***	−3.441 (0.730)***	−3.483 (0.709)***	−2.230 (0.683)***
WTO	−1.684 (1.303)	−1.563 (1.664)	−1.180 (1.768)	−0.742 (1.898)	−1.895 (2.084)	0.133 (2.012)
Constant	12.372 (1.398)***	14.151 (1.371)***	12.724 (2.790)***	12.671 (2.860)***	12.096 (2.885)***	21.914 (3.881)***
Observations	508	408	372	360	354	351
R^2	0.093	0.254	0.267	0.281	0.302	0.348
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

(*Notes.* OLS, ordinary least squares; WTO, World Trade Organization. Robust standard errors are given in parentheses. ***$p < .01$, **$p < .05$, *$p < .1$.)

TABLE 3. Estimated Effect of *Mixed* on Subsidies

	(1) *OLS*	*(2)* *OLS*	*(3)* *OLS*	*(4)* *OLS*	*(5)* *OLS*	*(6)* *OLS*
Mixed	1.062 (0.604)*	1.204 (0.657)*	1.681 (0.685)**	1.811 (0.713)**	1.659 (0.706)**	1.679 (0.682)**
Left Government		−2.345 (0.513)***	−2.500 (0.528)***	−2.430 (0.546)***	−2.527 (0.543)***	−2.438 (0.522)***
Federal		−5.385 (0.523)***	−4.573 (0.702)***	−4.833 (0.742)***	−4.600 (0.728)***	−3.727 (0.667)***
L. Trade			0.017 (0.009)*	0.011 (0.010)	0.016 (0.010)	0.013 (0.010)
L. Current account				−0.178 (0.099)*	−0.168 (0.100)*	−0.059 (0.102)
L. Growth					0.202 (0.093)**	0.224 (0.098)**
L. GDP per capita (log)						−1.393 (0.327)***
EU	−4.162 (0.634)***	−3.864 (0.663)***	−3.668 (0.682)***	−3.484 (0.721)***	−3.535 (0.699)***	−2.316 (0.672)***
WTO	−1.067 (1.130)	−0.825 (1.495)	−0.398 (1.605)	−0.126 (1.668)	−1.034 (1.830)	1.114 (1.803)
Constant	12.44 (1.390)***	14.22 (1.363)***	12.04 (2.699)***	12.16 (2.735)***	11.45 (2.754)***	20.93 (3.786)***
Observations	516	411	375	363	357	354
R^2	0.089	0.249	0.260	0.275	0.295	0.339
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

(*Notes.* OLS, ordinary least squares; WTO, World Trade Organization. Robust standard errors are given in parentheses. ***$p < .01$, **$p < .05$, *$p < .1$.)

response to globalization is an important issue for future research.[20]

Leftist governments spend relatively less of their budgets on subsidies than right-leaning governments, holding all else equal. One reason may be that subsidies tend to benefit primarily owners of capital, while left-leaning parties tend to represent, disproportionately, workers.

Holding all else equal, EU member states spend less of their budgets on subsidies than non-EU members. All estimated coefficients for *European Union* are negative and statistically significant. This finding is consistent with Aydin (2007) who, in a sample of 16 OECD countries from 1989 to 1995, found that non-EU countries spend more than twice as much of manufacturing GDP on subsidies than EU members (123). Similarly, the results reported in Tables 1–3 indicate that EU members spend, on average, 3.4 percent less on subsidies than non-members. EU rules restricting the provision of certain types of subsidies appear to be effective.

In contrast, WTO members spend just as much of total governmental outlays on subsidies as non-members. The estimated coefficients for *WTO* do not reach conventional levels of statistical significant in any of the estimated models.

Robustness Checks

A number of sensitivity analyses evaluate the robustness of the current study's findings. Due to space constraints, the results of the robustness checks do not appear here, but are available in a web appendix. Excluding EU-member countries from the sample ensures that EU states, which are predominately PR systems and tend to spend less on subsidies due to EU restrictions, do not drive the reported correlation between plurality rules and subsidies. Although the exclusion of EU countries decreases the sample size by 18%, on average, the estimated coefficients on all measures of electoral rules remain correctly signed and statistically significant. Further tests show that no single country drives the reported electoral system effects. For example, all of the reported results are robust to the exclusion of the United States.

All of the models discussed to this point include year-fixed effects, which control for the possibility that the relationship between subsidies and at least some of

[20] See, for example, Rickard (in press).

the independent variables changes over time. However, tests show that the year-fixed effects are jointly insignificant. Re-estimating all models without year-fixed effects produces very similar results.

The natural log of mean district magnitude is used as an additional measure of countries' electoral institutions. District magnitude correlates with but is not synonymous with the plurality-PR distinction. The estimated coefficients for the natural log of mean district magnitude are, however, consistent with a protectionist bias in majoritarian systems. The estimated coefficients for *Mean District Magnitude* are consistently negative and reach conventional levels of statistical significance in some models. The more legislators elected per district, the smaller the share of government expenditures allocated to subsidies. This suggests that a protectionist bias exists in countries with single member districts, and single member districts tend to be associated with majoritarian systems.

Electoral rules may be significant for trade protection via their effect on party strength, as suggested by Rogowski (1989) and Ehrlich (2007). To test whether electoral rules have an effect on subsidies independent of their effect on party strength, a cross-nationally comparable measure of party strength is needed. However, party strength is notoriously difficult to measure empirically (Bowler, Farrell, and Katz 1999). The key theoretical distinction between strong and weak party systems is whether or not voters choose a party with an associated package of policies or an individual candidate who will enter the bargaining process to further constituency interests. In strong-party systems, citizens vote for parties rather than for individual candidates; conversely, in weak-party systems, citizens vote for individual candidates. The variable *Avg_Pool* captures this distinction, by identifying candidates who complete for office individually.[21]

Electoral rules matter for subsidies independent of their effect on party strength. Controlling for party strength, spending on subsidies is a larger share of total outlays in majoritarian countries than in PR countries. In other words, the key electoral system results are robust to the inclusion of party strength.

The simple OLS models, estimated thus far, do not account for the fact that the choice of electoral institutions is unlikely to be random (for example, Boix 1999): Countries self-select into electoral systems. If electoral rules are not by random assignment, countries predisposed to certain types of trade barriers may choose certain types of electoral rules. In this case, the OLS estimates will be biased. Two additional models are estimated to check for any possible bias. The first is a two-stage least squares instrumental-variables regression where dummy variables specifying the time period during which a state's constitution was adopted are used to instrument for electoral systems (Persson and Tabellini 2003; Evans 2009). Historical experiences and regional trends may influence the selection of countries' electoral institutions (Rokkan 1970). The second specification employs a two-step framework: The first stage consists of a probit model of a country's electoral system predicted using time-period dummies to indicate when adoption of a state's constitution occurred. Subsequently, the inverse Mill's ratio from the first stage becomes the regressor in the second stage OLS to correct for selection bias. In all of the models that explicitly address the possibility of selection bias, electoral rules are found to have a consistently robust effect on subsidies; subsidy spending shares are higher in majoritarian systems than in PR systems. These results provide further evidence that the protectionist bias in majoritarian countries extends beyond tariffs to subsidies.

[21] These data are from Johnson and Wallack (2011). The variable is an average of both houses in bicameral systems.

Conclusion

This research offers a novel test of the ''protectionist bias'' that is believed to exist in majoritarian systems. Although increasingly accepted as conventional wisdom, empirical evidence of the protectionist bias in majoritarian politics has previously been limited to tariffs. Yet, tariffs are used less and less frequently by governments interested in trade protection. Instead, governments increasingly use NTBs, such as subsidies, to protect domestic producers from competition with foreign goods and services. The current study examines whether or not the protectionist bias in majoritarian systems extends beyond tariffs to subsidies. The reported findings show that governments in plurality systems spend more of their budgets on subsidies than governments in proportional systems, holding all else equal. This result is robust to numerous model specifications and robustness checks. The implication is that the protectionist bias in majoritarian systems does, in fact, extend beyond tariffs.

The current study makes several additional contributions: First, this research advances our understanding of government-funded subsidies. As government spending on subsidies increases, understanding the politics of subsidies becomes ever more important. Second, the protectionist bias in majoritarian politics has important implications for understanding countries' membership in and compliance with international trade agreements. International attempts to limit trade protection may face greater resistance from governments elected via majoritarian rules. Majoritarian countries may be less likely to join international trade agreements. Furthermore, majoritarian countries may be more likely to violate those agreements to which they ostensibly commit (Rickard 2010).

This research suggests several avenues for future study: First, the current study does not fully resolve the question of the effect electoral systems have on total trade protection. Second, electoral rules may affect not only the generosity of subsidies, but also the distribution of subsidies across economic sectors and industries. Focusing on aggregate subsidy spending may consequently miss an important part of the political story. These are interesting and important avenues for future research.

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